# On the growing accountability of central banks for financial stability–the macroprudential perspective[1]

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*We all are macroprudentialists now*
paraphrase of the famous remark of Milton Friedman (1965)

**Abstract**: The aim of this paper is to identify and assess, on a comparative, intra-country basis, the existing practices and developments in central bank accountability for financial stability, from a new–macroprudential policy–perspective. The paper aims to contribute to the ongoing debate on institutional arrangements for macroprudential policy. The debate as to whether the combination of monetary policy and financial supervision within one institution is not new. Nevertheless it is far from being resolved. The paper points to the need to establish clear, formal and robust mechanisms of central bank involvement in the process of executing macroprudential policy, at least as a data collection and analyzing institution.

**Keywords**: accountability, central bank, financial stability, macroprudential policy, regulations.

**JEL codes**: E58, E61, G18, G28, H12.

## Introduction

It is not surprising that the most important changes to economic policy and central banking as a part of it, tend to occur after the most significant and costly financial crises. The Great Depression resulted in the wave of state ownership of central banks worldwide (Capie, Goodhart, Fischer & Schnadt, 1994; Elgie & Thompson, 1998; Wood, 2005). The period following the Great Inflation was the period of concentration on qualitative aspects of central banking, i.e. independence, accountability, transparency and credibility (Capie, Goodhart, Fischer & Schnadt, 1994; Elgie & Thompson, 1998; Wood, 2005). Then the current crisis

– Global Financial Crisis (Davis & Green, 2010; Taylor, 2009) – will absolutely influence the way the central banks – and broader institutions of economic and financial policy – carry out their tasks and define their responsibilities.

There is a growing consensus in the post-crisis reality, among both economists – academics and policymakers, that there was at least one missing element of the financial safety net during the Global Financial Crisis. This element, which will probably improve the financial stability (or protect against financial instability) is the *macroprudential* orientation in regulatory and supervisory frameworks (Evanoff, Kaufman, Leonello & Manganelli, 2017; Mizen, Rubio & Turner, 2018). In response to the crisis countries as well as international bodies are evaluating and then implementing reforms aimed at reshaping the financial safety net. Recent experience has demonstrated that financial stability (as opposed to price stability) and macroprudential policy as an essential contributor to its delivery, should be given higher priority, compared with the past. While macroprudential policy tools were used in a number of countries well before the global financial crisis, the creation of a dedicated macroprudential policy framework seems to be prompted by the crisis experience.

The International Monetary Fund (2011) provided a formal definition of macroprudential policy as "a policy that uses primarily prudential tools to limit systemic or system-wide financial risk, thereby limiting the incidence of disruptions in the provision of key financial services that can have serious consequences for the real economy."

The main scope of this paper is the institutional dimension of macroprudential policy. To be effective the institutional framework needs to guarantee a policymaker's willingness and ability to act by including clear mandates and powers that are commensurate with those mandates, by safeguarding a high level of political and operational independence as well as accountability mechanisms supported by transparency and effective tools of communication. One of the widely proposed aspects of institutional arrangement is in regard to a prominent central bank role in macroprudential policy (see Table 1).

The principal objective of this paper is to identify and assess, on a comparative, intra-country basis, existing practices and developments in central banks' involvement and accountability for financial stability, from a new – macroprudential – perspective. The paper aims to contribute to the ongoing debate on institutional arrangements for macroprudential policy. The topic of an adequate institutional framework for macroprudential policy is essential, although it still lacks a strong theoretical background. It seems that now is a good moment to diagnose the situation and draw conclusions in the form of stylized facts (Borio, 2010; Dobrzańska, 2016; Nier, Osinski, Jácome & Madrid, 2011) or a comparative study based on primary data (Egawa, Otani & Sakiyama, 2015; Bank for International Settlements, 2017).

The paper is organized as follows. The introduction clarifies the motivation for writing the paper, its purpose and structure. Research methodology

**Table 1. Selected recommendations for structuring macroprudential policy – the central bank role**

| Authors | Recommendations for institutional design |
|---|---|
| Borio (2010) | Given their expertise, central banks should play a *key* role in macroprudential policy.<br>Operational independence for crisis *prevention* should be assured, while recognizing that the government will inevitably have to be closely involved at the crisis *management* stage. |
| IMF (2011) | The central bank should be given a prominent role in macroprudential policymaking.<br>A macroprudential authority should be identified. It should have a clear mandate and objectives, and should be given adequate powers, matched with strong accountability.<br>Its powers should encompass the collection of information, establishing the perimeters of reporting and regulation and activation – as well as calibration – of instruments under its direct control. |
| Nier et al. (2011) | The central bank should play an important role in macroprudential policymaking.<br>Complex and fragmented regulatory structures are unlikely to be conducive to a successful mitigation of systemic risk and should therefore be avoided.<br>Participation of the treasury in the policy process is useful but a leading role poses risks. |
| Knot (2014) | The governance framework should also reflect the system-wide nature of macroprudential policy (a leading role of central banks in macroprudential policy because of their expertise and their existing responsibilities in the area of financial stability) |

and sample are described in Section 1. The following sections are devoted to the presentation of the empirical results. In Section 2 institutional models of macroprudential policy are compared. Section 3 is devoted to the analysis of research in reference to central bank involvement in macroprudential policy measures. Section 4 discusses the transparency issue of macroprudential authority. Finally there is the conclusion with a discussion of policy implications.

# 1. Methodology and sample

The research of institutional arrangements for macroprudential policy was conducted on a sample of fifty macroprudential authorities from the OECD and other more developed countries between November 2016 and February 2017. The empirical analysis employs information collected from a questionnaire from thirty countries (see Table 3). The countries differ in terms of institutional framework, level of economic development as well as the size and level

of development of the financial sector. As part of the research conducted, two research hypotheses were formulated and subsequently verified.

**H1:** Central banks–due to their expertise, incentive to take action and political independence–play important role in macroprudential policy institutional arrangements, irrespective of the institutional model of macroprudential policy implemented.

Many researchers suggest that macroprudential policy should include an active role for the central bank. Borio (2011) and Caruana (2010) argue that the central bank is an institution with the best competences in relation to macroeconomic policy. Similarly Nier et al. (2011) suggest that it is beneficial to take advantage of the expertise of the central bank, while Lim, Krznar, Lipinsky, Otami and Wu (2013) argue that central bank involvement improves the timely response of macroprudential policy, which is the consequence of short internal lags of central bank policy (Eusepi & Preston, 2007; González-Páramo, 2007). Finally it needs to be stressed that objectives of monetary policy and macroprudential policy are closely interlinked, at least in the long term, therefore the central bank will be motivated to protect the financial system against financial instability (Blinder, 2010; Duff, 2014; Aikman, Giese, Kapadia & McLeay, 2018).

**H2:** The central bank-based model of macroprudential policy is more advanced in qualitative aspects of design and more homogenous–comparing to other models–being the consequence of applying a rational analogy to the well-known institutional design of effective monetary policy.

Macroprudential policy and its institutional framework seems to be comparable in many respects to the monetary policy frameworks in the 1970s and early 1980s. The level of uncertainty with reference to the ultimate objective, intermediate targets, as well as the instruments that should be applied to realize the objective of monetary policy is similar to the level of uncertainty with operationalization of macroprudential policy. This comparison suggests examining macroprudential policy frameworks from the point of view of monetary policy (the lens of effectiveness in stabilizing the price level, i.e. explicit inflation objective, independence of the monetary authority, transparency of monetary policy used to shape agents' expectations and arrangements introduced to ensure accountability) (Bernanke & Mishkin, 1997; Bernanke, Laubach, Mishkin & Posen, 1999).

The hypotheses are verified by comparing the level of the overall accountability index, transparency index as well as the level of sub-indices in relation to identified models of macroprudential policy institutional arrangements.

When constructing the index of institutional arrangement of macroprudential policy the main goal was to strive to offer a measure which would facilitate a comparison of the solutions of individual countries. The following factors employed in the process had significant impact on the constituent components of the index:

– former experience in the field of institutional, qualitative aspects of central banks and financial regulators policy (Blinder et al., 2009, pp. 910-945; Cukierman, 2001; De Haan et al., 2004, pp. 775-794; Eijffinger & Hoeberichts, 2000, pp. 73-96; Horváth & Vaško, 2016, pp. 45-56; Masciandaro, Quintyn & Taylor, 2008, pp. 833-848).
– hypotheses to be verified in this paper (hence for example indication of objective accountability, transparency and central bank involvement measures).
– the degree of advancement of research on macroprudential policy, its effectiveness, institutional framework and tools (Borio, 2014, pp. 79-85; Galati & Moessner, 2013, pp. 846-878; Hanson, Kashyap & Stein, 2011, pp. 3-28; Milne, 2009, pp. 608-629).

The institutional arrangements measure for macroprudential policy, developed for the purposes of this research, is comprised of the following sub-indices and two study stages:
– stage one (identification of the macroprudential authority model):
– composition of macroprudential authority (who is responsible for macroprudential policy?),
– central bank involvement in macroprudential policy,
– stage two (overall accountability index):
– objective accountability sub-index (accountability for what?),
– subjective accountability for macroprudential policy sub-index (accountability before whom?),
– transparency as a demonstration of subjective accountability sub-index (accountability using which communication tools and how often?).

When constructing the indices all components were assigned 0 points (the component does not apply) or 1 point (the component partly applies) and 2 (the component fully applies) – in the case of stage one of the survey, i.e. identification of the macroprudential authority model and 0 points (the component does not apply) or 1 point (the component fully applies) – as regards the overall accountability index. Thus individual components were not differentiated for their varying importance mainly due to the fact that the matter of institutional arrangement for macroprudential policy is still the topic of lively discussion and controversy.

The paper builds on existing theoretical considerations and the survey of countries' practice in applying a macroprudential framework. As part of the survey conducted among 30 macroprudential authorities an index of central bank involvement in macroprudential policy was constructed. A total of 23 criteria are identified to assess and compare the macroprudential policy institutional arrangements (Table 2).

A comparative, cross-country analysis and comparison of different sub-indices and overall index values were the basis for verifying the hypotheses and disentangling empirically the institutional differences between macroprudential policy regimes, focusing on the diverse role of central banks.

**Table 2. Construction of the accountability for a macroprudential policy index**

| **Composition of macroprudential authority** |
|---|
| Is there a formal body/institution responsible for macroprudential policy in your country?<br>What is the composition of the macroprudential policy authority (the MPA):<br>– single body<br>– collegial body<br>– multiple body<br>Who is responsible for (central bank involvement, from 0 to 6):<br>– decision making in macroprudential policy?<br>– calibration of instruments of macroprudential policy?<br>– analysis of systemic risk? |
| **Overall accountability index** (from 0 to 15) |
| *Accountability for what?* (from 0 to 3)<br>  Does the MPA have an *explicit* objective for macroprudential policy (objective documented in law or in another formal way)?<br>  Is this objective quantifiable (or partly quantifiable)?<br>  Are there secondary explicit objectives for macroprudential policy? |
| *Accountable how?* (from 0 to 8)<br>  Does the MPA make a regular assessment of systemic risk?<br>  Is the outcome of this assessment published (e.g. in Financial Stability Report, other special publication)?<br>  If yes, how frequent?<br>  Does the MPA organize press conferences related to systemic risk (ex-post approach, explaining past movements)?<br>  Does the MPA organize press conferences related to systemic risk (ex-ante approach, explaining future movements)?<br>  Does the MPA publish press releases?<br>  Does the MPA publish meeting records?<br>  Does the MPA make any statement of future movements in relation to macroprudential policy (ex-ante approach)?<br>  Are the communication tools required by law? |
| *Accountability to whom?* (from 0 to 4)<br>  Is the MPA accountable to another party in relation to macroprudential policy actions? Is the MPA monitored by another party (e.g. the Parliament)?<br>  Does the MPA have to report to the accountee on macroprudential policy decisions (besides annual reports)?<br>  Has the government/ Parliament the right to give the MPA instructions related to macroprudential policy?<br>  Is there some kind of procedure for the implementation of an override mechanism? |

## 2. Institutional models of macroprudential policy around the world

There is a growing intensity in both theoretical discussion and practical implementation of macroprudential approach in financial safety net architecture. The institutional structure of financial supervision and financial safety net arrangements are evolving but there is no consensus and no simple dominance of any of the existing regulatory regimes.

In most countries, there was a clear need – as a consequence of the Global Financial Crisis – to establish a new or indicate an existing authority for macroprudential policy. Such an authority could be an institution (existing or a new, e.g. central bank, financial regulator, ministry of finance) or a collegial body (e.g. committee, council). Institutional arrangements for macroprudential policy vary among jurisdictions, nevertheless two dominant models might be identified[3] (Table 3): the model based on the central bank as a sole macroprudential authority (50.0% of analyzed cases) and the model based on a collegial body with a highly diversified composition across countries, as a macroprudential authority (26.7% of analyzed cases). The arrangements identified with reference to a collegial body vary across countries, however there seem to be three typical bodies involved, which are: the central bank, a financial supervisory authority, as well as the institution representing the government (in Slovenia as a non-voting member, in Germany and France as a chair member). In some countries the collegial body involves also representatives of deposit guarantee institution (Poland, Slovenia and the United States) or qualified external experts (France). In case of involving the government (ministry of finance) in macroprudential authority a specific trade-off appears: first, a useful mechanism of political legitimacy is created, second, political economic risks can materialize through such an arrangement. The other three models are: multiple body as a macroprudential authority, financial supervisory institution as a sole macroprudential authority and the ministry of finance as a sole macroprudential authority.

Four identified models of macroprudential policy institutional arrangements (financial supervisor-based and ministry of finance-based models are treated together as other models) differ in reference to both the value of introduced overall accountability index and the value of descriptive statistics (Table 4). The average value of the proposed index is the highest (11.33, which is 62.96% of the maximum value according to the applied methodology) in the case of the

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[3] Australia as the only country in the sample, which does not have an explicit/formal macroprudential authority. However the macroprudential policy is an element of a broader and more comprehensive financial stability policy framework (the macroprudential element of that framework rests with the Australian Prudential Regulation Authority with analytical support from the Reserve Bank of Australia).

**Table 3. Macroprudential authority models across selected OECD countries**

| Central bank as a macro-prudential authority | Collegial body as a macro-prudential authority | Multiple body as a macro-prudential authority | Financial supervisor as a macro-prudential authority | Ministry of finance as a macro-prudential authority |
|---|---|---|---|---|
| Belgium<br>Cyprus<br>Czech Republic<br>Estonia<br>Greece<br>Hungary<br>Indonesia<br>Ireland<br>Latvia<br>Lithuania<br>New Zealand<br>Portugal<br>Slovakia<br>South Africa<br>United Kingdom* | Denmark<br>France<br>Germany<br>Luxembourg<br>Poland<br>Romania<br>Slovenia<br>United States | Australia<br>Italy**<br>Switzerland<br>Turkey | Finland<br>Sweden | Norway |

 * In the UK there is a special type of collegial body, i.e. Financial Policy Committee at the Bank of England with five executives of the Bank of England, Chief Executive of the Financial Conduct Authority, four external members and non-voting HM Treasury member (due to the dominance of the Bank of England, this case was classified as a central bank-based model).

** In 2017 a collegial body (Macroprudential Policy Committee) as a macroprudential authority will be established.

central bank-based model and the lowest in other models (6.34, i.e. only 35.2% of maximum value of the index). The multiple body based model and collegial body-based model can be characterized as at the middle-level of overall accountability index (respectively 8.75 and 7.75). A higher value of the index should be interpreted as a higher level of formality, transparency and objective accountability in designing institutional arrangements.

The other discrepancy between the four identified institutional models of macroprudential policy arrangements relates to a substantially different level of relative variation of institutional solutions: low in the case of the multiple body based model (measured both by standard deviation – 1.71 and variation coefficient – 19.52%) and the central bank based model (measured both by standard deviation – 2.26 and variation coefficient – 19.92%) and really high in the case of other models (standard deviation – 6.72 and variation coefficient – 106.03%). The second is probably the consequence of putting two different models in one group as well as the low number of observations in case of these two models (Finland, Sweden and Norway).

**Table 4. Descriptive statistics of the overall accountability index for macroprudential policy**

| Macroprudential authority model | Average value (% of max value) | Standard deviation | Variation coefficient |
|---|---|---|---|
| Central bank based | 11.33 (62.96) | 2.26 | 19.92 |
| Collegial body based | 7.75 (43.06) | 2.43 | 31.42 |
| Multiple body based | 8.75 (48.61) | 1.71 | 19.52 |
| Other models | 6.34 (35.20) | 6.72 | 106.03 |

Source: calculations based on own research.

## 3. Central bank involvement in the macroprudential policy index

Besides identifying models of macroprudential policy arrangement the objective of the paper is also to assess the level of central bank involvement in macroprudential policy. It seems to be obvious that this involvement will be much higher in the case of the central bank-based model, however, it might also be interesting to determine what – if any – is the role of the central bank in other identified models.

To assess this aspect the simple measure of central bank involvement was applied. Since macroprudential policy comprises of three successive tasks, i.e. provision of a systemic risk analysis, decision making and then calibration of macroprudential policy instruments (Figure 1), all three possible activities of central bank were assessed (with the same simple methodology: 0 points – the component does not apply, 1 point – the component partly applies and 2 points – the component fully applies).

The following results with reference to central bank involvement in macroprudential policy might be formulated (Figure 2). First, it is not surprising that central bank involvement in macroprudential policy is the highest in the case of central bank-based model, but the level of this involvement (on average 95.56% of maximum value of the index) indicates that in most countries which apply central bank-based model of macroprudential policy, the central bank is the only one institution with full responsibility for establishing and executing the macroprudential policy. Second, central bank involvement is much higher in the collegial body-based model compared to the multiple body-based model (respectively 54.17% compared to 33.3% of maximum value of index). Third, there was no single country in which the central bank would not be involved
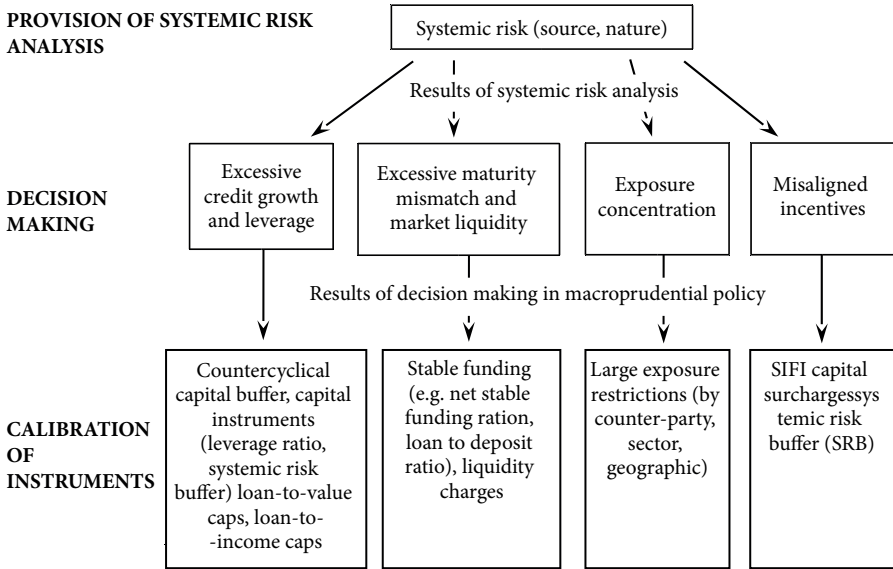
Systemic risk (source, nature)

Results of systemic risk analysis

**DECISION
MAKING**

| Excessive credit growth and leverage | Excessive maturity mismatch and market liquidity | Exposure concentration | Misaligned incentives |

Results of decision making in macroprudential policy

**CALIBRATION
OF
INSTRUMENTS**

| Countercyclical capital buffer, capital instruments (leverage ratio, systemic risk buffer) loan-to-value caps, loan-to--income caps | Stable funding (e.g. net stable funding ration, loan to deposit ratio), liquidity charges | Large exposure restrictions (by counter-party, sector, geographic) | SIFI capital surchargessys temic risk buffer (SRB) |

**Figure 1. Sequence of tasks in macroprudential policy – analytical model**

in macroprudential policy at all. There is at least a partial engagement of the central bank in the provision of systemic risk analysis. It seems that in all thirty jurisdictions analyzed, countries take advantage of the expertise of the central bank in the area of the assessment of systemic risk.

A high level of central bank involvement in macroprudential policy is accompanied by a very low level of relative variation of institutional solutions (as measured by standard deviation 0.7 and variation coefficient – 12.27%, Figure
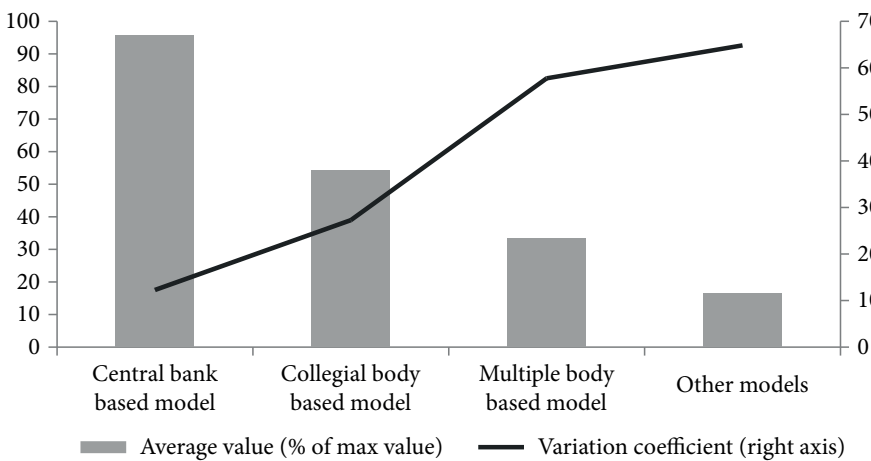


**Figure 2. Central bank involvement index value and variation across models of
macroprudential policy**

2) in countries with a central bank-based model. The level of variation is increasing from 27.27% (variation coefficient of collegial body-based model), then 57.74% (variation coefficient of multiple body-based model) till the level of 64.83% (variation coefficient of other models).

## 4. Transparency of macroprudential authorities around the world

It is extremely difficult to identify the optimum level of transparency in any kind of economic and financial policy. This is also the case for macroprudential policy (Walsh, 2007). First of all, because transparency is a multi-dimensional issue, Geraats (2002) argue that there are at least five dimensions, i.e. political, procedural, economic, operational and policy, which correspond to being transparent about objectives, the decision-making process, forecasts and models being the background of the decision-making process, communication about instruments, their calibration and about policy actions. Second, being too transparent could be problematic since agents may be simply confused by the large amount of information (Van der Cruijsen, Eijffinger & Hoogduin, 2008). Similarly, Mishkin (2004) warns that a high degree of transparency might disrupt communication with the public which would not easily understand the forecasts of the central bank.

Significant discrepancies in the value of the transparency index within the sample of thirty macroprudential authorities can be observed (see Figure 3, black countries represent the central bank-based model). Although none of the macroprudential authorities disclosed the minimum value (which is 0 according to the applied methodology), in one case (i.e. Slovenia) its value was as low as 2 points on the scale from 0 to 8 (28% of maximum value of the index). In contrast to this case two other countries achieved the maximum score for transparency level in line with the methodology employed in the survey (i.e. Sweden and the United Kingdom). The next six countries achieved the level of 88% of maximum value of the index (and five of them are countries which applied the central bank-based model).

Undoubtedly these results are only a point of departure for further studies which should strive to review how the high or low level of transparency of the macroprudential authority is correlated with the effectiveness of its policy. Related studies conducted so far as regards central bank financial stability policy – where the ultimate objective is parallel to macroprudential policy objective (Blinder, Ehrmann, Fratzscher, de Haan & Jansen, 2001; Horváth & Vaško, 2016) – indicate a pattern which suggests that a higher transparency of efforts undertaken by central banks may contribute to fewer financial crises as well as help to reduce their scale.

**Figure 3. Macroprudential policy transparency index – cross-country comparison (% of maximum value of the index)\***

\* Black is used to identify the central bank-based model of macroprudential policy.

Transparency index values vary across identified models of macroprudential policy arrangements (Table 5). The average value of the index is the highest in the case of central bank-based model (5.87 point, which is above 73% of the maximum value of the index), then the multiple body-based model (the value is a bit lower, i.e. 5.25, which is about 65% of maximum value of the index). The transparency index value decreases in the case of the collegial body based model (4.13, which is about 51% of maximum value of the index), and the lowest one can be observed in the case of other models (only 3.4, which is 42% of maximum value). According to the methodology applied in this survey a higher value of the index can be interpreted as a higher level of transparency with regard to macroprudential policy, i.e. frequent and precise communication to the public about the instruments applied, publishing of financial stability reports, their coverage and forward-looking character, publishing stress test results, etc.).

**Table 5. Descriptive statistics of transparency the index for macroprudential policy models**

| Macroprudential authority model | Average value (% of max value) | Standard deviation | Variation coefficient |
|---|---|---|---|
| Central bank based | 5.87 (73.3) | 1.25 | 21.24 |
| Collegial body based | 4.13 (51.6) | 1.26 | 30.22 |
| Multiple body based | 5.25 (65.63) | 1.71 | 32.53 |
| Other models | 3.40 (42.45) | 3.20 | 94.11 |

Macroprudential policy institutional models differ in reference to the relative variation of institutional solutions for transparency as well (see Table 4). The lowest level of variation can be observed in the case of central bank-based model (as measured by standard deviation – 1.25 and also by variation coefficient – 21.24%), the highest in relation to other models (as measured by standard deviation – 3.2 and largely by variation coefficient – 94.11%). Two other identified models (collegial body based and multiple body based) seem to be characterized by moderate levels of relative variation in transparency solutions, especially as measured by variation coefficient (respectively 30.22% and 32.53%).

## Conclusions

The putting in place of a macroprudential institutional framework seems to be the biggest single lesson from the Global Financial Crisis that has been embedded in policy. There is a general tendency to increase the role of the central bank in stabilizing the financial system through its role in macroprudential policy. The research conducted was mainly aimed at the identification and evaluation of trends prevailing in the practices of central banks concerning the dynamics of selected institutional determinants of macroprudential policy.

It is clear that the statement 'one-size-fits-all' has no application in relation to institutional arrangements for macroprudential policy – designing a 'one-for-all' general macroprudential standard does not make a country immune to the crisis situation. Nevertheless, although the institutional arrangements are inevitable shaped by country-specific circumstances, some general tendencies might be identified. The research conducted among thirty macroprudential authorities across the world has led to the development of some general conclusions, as follows:

– at least five different institutional models of macroprudential policy can be identified: central bank-based, collegial body-based, multiple body-based, financial supervisory authority-based and ministry of finance-based, however the two first seem to be applied most often,
– overall democratic accountability for macroprudential policy, which encompass formal objective accountability (accountability for what?), subjective accountability (accountability before whom?), as well as transparency as a demonstration of subjective accountability (accountability using which communication tools and how often?) is much stronger, formalized and homogenous in reference to the central bank-based model,
– the transparency level (interpreted as the communication strategy of the macroprudential authority concerning efforts aimed at stabilizing the financial system) is significantly higher in the case of the central bank-based model,
– the debate whether the combination of monetary policy and financial supervision within one institution is not new, but it is far from being resolved. The paper sheds light on the need to establish clear, formal and robust mechanisms of central bank involvement in the process of executing macroprudential policy, at least as an institution providing systemic risk analysis – such an involvement creates new opportunities for central banks to perceive the protection of financial stability as an on-going process.

The continuation of this research will deliver answers to some important governance issues which merit special attention: first, what is, if any, the degree of insulation of the macroprudential authority from the political cycle, second, what are the determinants for the design of g institutional arrangements for macroprudential policy and third, which elements of these institutional arrangements are crucial for enhancing the effectiveness of macroprudential policy.

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